

HARVARD UNIVERSITY

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Mr. Alex Lopes
Deemed Exports and Electronics Division
U.S. Department of Commerce
Bureau of Industry and Security, Regulatory Policy Division
14th & Pennsylvania Avenue, NW, Room 2705
Washington, DC 20230
ATTN: RIN 0694-AD29

Subject: Comments to Revision and Clarification of Deemed Export Regulatory Requirements

Dear Mr. Lopes:

Thank you for the advance notice of proposed rulemaking for "Revision and Clarification of Deemed Export Regulatory Requirements." We greatly appreciate the opportunity to comment on the recommendations of the Office of Inspector General's report on deemed exports (OIG report) as well as on any proposed regulations or amendments that emerge from this preliminary process.

Harvard University takes its responsibilities under the export control laws seriously. The University has a policy concerning compliance with these rules and has used written materials, general training sessions, and targeted training to remind faculty, researchers, and administrators of the legal requirements.

The release of the OIG report ignited great concern within the academic scientific community, in the National Academies of Science, and among policy leaders, who fear that the conduct of essential and fundamental research at academic institutions may be threatened. I would like to express appreciation for the extensive outreach process the Commerce Department has engaged in over the past many months in educating the community about the OIG report and in seeking information about the potential impact the report's recommendations and interpretations might have on the conduct of fundamental research. During these interactions, the Department has noted the importance of ensuring that any new rules, regulations, or interpretations of regulations both protect our national security and foster the collaborative nature of fundamental research that is a pillar of this country's security and economic strength. As Kenneth Juster, former under secretary for industry, wrote in a letter to me eight months ago, "The Administration appreciates the vital role that U.S. institutions of higher education have played and will continue to play in advancing science and technology for future generations. The fundamental research that is undertaken at such institutions promotes both our national economic welfare and our national security. Indeed, the Administration recognizes that U.S. leadership in science and technology is an essential element of our economic and physical security. Accordingly, we are strongly committed to working with the academic and research community to ensure that our export control policies do not undermine the openness and strength of our universities and research institutions, while still achieving our legitimate national security goals."

We believe that the OIG recommendations fail to recognize the real consequences the suggested changes will impose on the research activities at American universities. If adopted as proposed, the recommendations could cause significant damage to the scientific enterprise in the United States and, in so doing, undermine our national security. They would result in the reduction or preclusion of fundamental research in a broad range of areas as well as the erosion of our national research infrastructure and processes of innovation. And we fear they will breed a culture of resentment among those individuals who historically have come to this country to study and learn and have returned to their homelands as our greatest allies.

We support the broader comments submitted by the Association of American Universities, the Association of Academic Medical Centers, and Council on Governmental Relations. The comments here are more narrowly focused. On behalf of the University and its faculty, we review below the potential implications associated with the proposed changes for the essential research that is conducted on our campus. In particular, we take issue with the OIG's recommendation to make what purports to be a minor technical edit—"and" to "or" in the definition of "use"—as well as the suggestion to probe into an individual's national origin. In an effort to advance the discussions, we also recommend clarifications to the regulations that we hope the Department will consider in drafting new regulations for publication in the Federal Register and further comment.

U.S. Support for Fundamental Research

The provisions for promotion of fundamental research lie at the heart of the current Export Administration Regulations (EAR). Support for fundamental research is not an exemption from export controls. Rather, the EAR recognize that the free communication of research findings through publication, teaching, conferences, and other forms of exchange brings those findings into the public domain. The EAR do not control publicly available technology and software that are already published or will be published, including publicly available technology and software that "arise during, or result from, fundamental research." 15 C.F.R. § 734.3(b)(3).

The framers of the regulations executed the Congressional intent to "sustain vigorous scientific enterprise" by recognizing that fundamental research is in itself a form of publication: "It is the policy of the United States to sustain vigorous scientific enterprise. To do so involves sustaining the ability of scientists and other scholars freely to communicate research findings, in accordance with the applicable provisions of law, by means of publication, teaching, conferences, and other forms of scholarly exchange." Export Administration Act of 1979 as amended, PL 96-72, Section 3(12). The regulations recognize that the promotion of U.S. national security and economic security requires ensuring that fundamental research can proceed only with the strongest government support.

Historically, universities have understood that fundamental research within the meaning of the EAR also includes access to technology that is necessary to conduct that open research. Such an interpretation makes sense and is consistent with the way research is conducted throughout the world. Fundamental research and the use of equipment to conduct such research are inseparable. It would be difficult, if not impossible, to conduct research involving equipment without "operating" equipment. Nor would it be easy to conduct research without knowing at some level how the equipment necessary for the experiment works. And Harvard cannot responsibly allow its students and faculty to conduct research without training them in the safe use and operation of the equipment needed for their research.

The OIG's report ignores these realities and instead recommends that universities secure licenses for the use of equipment that is necessary to the conduct of the fundamental research, but is not in and of itself the subject of the research. This strikes us as potentially quite intrusive and cumbersome. Instead, the Commerce Department should consider clarifying the definition of "fundamental research" or "use" to allow our students, faculty, and other researchers access to technology necessary for the conduct of open research.

The Unique Qualities of a University Campus

The scope of the problem generated by the OIG's recommendations is enormous given the size, diversity, and complexity of the University community. There are more than 1,800 laboratories at Harvard, dispersed throughout several undergraduate and graduate programs in at least two cities. Equipment and technologies that appear on the controlled list would be found in a large percentage of these laboratories.

As of today, Harvard has more than 3,400 active students at its facilities who are neither U.S. citizens nor U.S. permanent residents. It has approximately 3,650 foreign scholars with Harvard appointments (at both the University and its affiliated hospitals). These numbers do not include the numerous employees from foreign countries. A large percentage of our population of international students and scholars changes each year. These international students and scholars study, teach, and participate in open research projects and, importantly in an academic setting, interact in a free environment across our campuses.

Unlike commercial proprietary research, research in a university setting has few boundaries. Once students and scholars are permitted by the government to come to this country on valid visas, Harvard does not and should not restrict their involvement. It is this diversity and fluidity of people and ideas that has resulted in our greatest scientific advancements.

Fundamental research on campus is demonstrably more fluid than commercial proprietary research. It frequently triggers new lines of inquiry and the need to use equipment across a wide spectrum of disciplines, sometimes with little advance notice. Unlike commercial proprietary research, university research extends into virtually every field of science and engineering.

Equipment Use on Campus

We have conducted a preliminary review of the equipment at Harvard that would be affected by the proposed changes to the regulations, and have identified some equipment that would be controlled for access for use by every international student and scholar on campus except those from Canada. We also have thousands of pieces of equipment subject to Anti-Terrorism (AT) controls as well as students and scholars who would need licenses for access to this equipment and technology if the OIG's recommendations were adopted.

While we have not been able to conduct an exhaustive search, we believe that our international scholars and students may currently have access to use technology for equipment in the following categories: 2D101, 2E101, 3E292, 3E991, 6E101, and 6E201, including chemical vapor deposition (CVD) furnaces, specialized cameras, oscilloscopes, sensors, monitoring systems, lasers, pumps, amplifiers, and spectrum analyzers. We encourage the Department to review these categories, in particular, to determine whether access to this technology in the context of fundamental research

genuinely poses a security threat to our country. Given the nature and broad availability of the equipment, we suspect that the restrictions could be lifted without risk to national security.

While the number of categories may seem small, requiring licenses for access to this subset is consequential. As an initial matter, the equipment is scattered in various laboratories across our Cambridge and Boston campuses. As with many large research institutions, we have a Faculty of Arts and Sciences, a Medical School, a School of Public Health, and other schools. In addition, a number of our faculty practice medicine at one or more of our affiliated research hospitals. There is no single lab where all our physics research is generated. There is no single building where our chemistry and biology experiments are conducted.

In addition, our international students and scholars are scattered throughout the laboratories on both campuses. It is fair to say that we have and, indeed, embrace participation by foreign nationals in all these labs. Tracking the movements of our large international community would, again, be no small task and would not be palatable to a university that adheres strongly to principles of openness and non-discrimination. Undergraduate students, in particular, are often involved in small, short-term research projects as part of their undergraduate training. The timetable for these projects—from identification and inception to completion—is only a few months, essentially incompatible with the schedule for obtaining licenses.

Further, licensing equipment in certain of these categories has the potential to impede or shut down whole segments of research. Innovations and discoveries in fundamental physics could be threatened if the use restrictions on laser systems were permitted to stand without refinement. Some of our physics faculty involved in research on inertial sensing and gravity detection have expressed genuine concern that their government-sponsored research would be substantially hindered if the use technology controls were applied to their projects. The same could be said of the work conducted by our engineering departments, which regularly rely on lasers, pumps, cameras, or vacuums, some of which may be controlled under the EAR. Our astrophysicists routinely use powerful cameras, sensors, lenses, and computer clusters for their discoveries. It is hard to see how our observatory could be equipped and utilized if the Department limited the involvement of our international researchers.

We are operating in a world where technology and information are easily and rapidly available from retail and wholesale establishments, through the Internet and easy avenues of exchange. Importantly, the vast majority of equipment that is controlled for use under the EAR and found on our campuses has been purchased from well-known, reputable commercial companies that sell such equipment on the open market. These off-the-shelf instruments are used to conduct open research that is reported in publicly available scientific journals. We encourage the Department to make clear in the regulations that it does not intend to restrict access to technology relating to items that are available on the open market.

Practical Effect of Restricting Equipment Use in Fundamental Research: Reversing the Administration's Policy

Restricting the use of equipment to pursue fundamental research would have the practical effect in many fields of restricting and limiting the research itself. We believe that neither the OIG nor the Administration intends this outcome.

While we have begun the preliminary work to try to give the Department a sense of the areas in which we are likely to find the greatest barriers to scientific research, we have not completed the work

necessary to identify the technologies that would require licenses under the OIG's recommendation. The administrative processes necessary to get to those determinations will have the practical effect of grinding research to a halt while administrators and faculty sift through the interactions of every foreign national and every piece of equipment to make a determination of when a license is necessary.

To follow the published guidance from the Commerce Department for classifying products and technologies, and applying for deemed export licenses, we would need to:

- review every technology, item, and software on campus to determine if it is subject to the technologies regulated for "use" controls;
- classify the goods, software, and technologies;
- identify the international students and scholars;
- track down and review their CVs, background, and country information (including obtaining the information from the individuals before they arrive on campus);
- apply for licenses, including the following:
 - describe all of the parties to the transaction;
 - describe the exact project location where the technology or software would be used;
 - describe the type of technology or software;
 - describe the form in which the data or software will be released;
 - describe the uses for which the data or software will be employed;
 - explain the process, product, size, and output capacity of all items to be produced with the technology or software or other description that delineates, defines, or limits the controlled technology or software;
 - describe the availability abroad of comparable foreign technology or software;
 - describe the technology control plan as tailored to that individual;
 - obtain and describe the individual's personal background information;
 - describe the educational and vocational background of the individual;
 - describe the individual's employment history;
 - catalog the individual's military service and describe it where applicable;
 - provide any special information about the applicant;
- track the license approvals and provisos;
- implement licenses, including putting individually tailored technology control plans in place;
- implement a set of physical security procedures to ensure that individuals do not have access to controlled technology while the license applications are pending; and
- set up an administrative body within the University to coordinate and follow up on all of these matters.

Based on our experience in reviewing technologies subject to control on our campus, and our understanding of the requirements for deemed export license applications, we estimate it would take 10

to 25 person hours per applicant counting the time of the applicant, administration, research professors, and outside advisors to identify and classify the relevant technology, complete and submit an application, and implement restrictions contained in a license.

We see it as no exaggeration that such a burden would trigger the need for an additional tens of thousands to perhaps hundreds of thousands of person hours to address the deemed export needs of our international students and scholars during their terms on campus, particularly since the technology, individuals, and controls change over time. It is difficult to come up with a credible forecast of the potential cost to the research community, but we estimate that compliance at Harvard could run into millions of dollars annually. The proposed ministerial change—“and” to “or”—would divert substantial resources from our core missions of education and research without any clear improvement in national security. It would represent one of the most significant single administrative requirements imposed on university research in recent years.

In considering the burdens to the University, it is important to recognize that fundamental research at academic institutions is often low budget and decentralized, particularly in comparison to corporate research. Many grants to Harvard students and scholars are small, and these grants lack the administrative budgets necessary to handle significant additional overhead. While corporate research may be able to spread the costs over a large production run, university research typically produces a single report, study, publication, or prototype that is often disseminated broadly without significant charge.

In view of the prohibitive costs of establishing unique technology control plans and monitoring such plans, the fluidity of our research and our population, and the substantial civil and criminal penalties imposed even on mistakes, Harvard could make the rational business judgment that it should apply for licenses for all of its international students and scholars. At the same time, we recognize that such an approach would leave the Department with little time to do anything but review license applications.

Use of Foreign Nationals' Country of Birth as Criterion for Deemed Export License Requirement

Current deemed export applications require individuals to disclose both citizenship and permanent residency. It is neither reasonable nor permissible for the government to compel universities to seek in addition an individual's country of birth, as the Inspector General suggests.

As an initial matter, it is difficult to see what probative information the government would gain by inquiring into national origin. It is unlikely there will be many individuals who are born in a country, become a citizen of another country, and then a permanent resident of another country. In our experience, it is far more common that individuals are born in a country, retain their citizenship in that country, and move to another country. Moreover, the Department's current policy reflects the traditional understanding that citizenship denotes substantial personal connections to that country. The fact that a person was born in a particular country does not denote any such connection. Thus, seeking citizenship and permanent residency—objective and easily verifiable data—picks up most of the relevant information for the vast majority of people affected by the proposed deemed export rules.

Finally, there are substantial legal issues that the Department would have to overcome before adopting the OIG's suggestion. Harvard does not collect information on national origin, so as to remain compliant with federal laws and regulations, which prohibit it from discriminating on the basis of national origin. Imposing a requirement to seek national origin as a criterion for a deemed export license

not only would force Harvard to adopt new policies to capture this information, but also would demand a change in long-standing Department policy and amendments to numerous laws.

Thus, we do not see any need for the Department to inquire beyond an individual's citizenship or permanent residency, as the deemed export applications already do.

Clarifications of Supplemental Questions and Answers on Government Sponsored Research and Fundamental Research

Answer to Question A(4)

The OIG identified a specific provision, section 734.11, which provides special guidance for government-sponsored research covered by contractor controls. For government-sponsored research where the government has imposed separate national security controls, those national security controls should determine whether technology may be disclosed to foreign nationals. The regulation permits the export or re-export of information that is consistent with these national security goals. Section 734.11 very specifically does not trigger the need for additional licensing provided that the researcher follows the specific national security controls imposed by the national security agencies.

Those conducting fundamental research have long relied on the consistent BIS position that national security controls, rather than licensing requirements, determine the restrictions on transfers to foreign persons under these government-supervised grants. We agree that the national security agency such as the Department of Defense or Department of Energy will be in the best position to determine if specific research presents risks to U.S. national security.

We have no objection to clarifying the language in this section so long as the clarification retains the current policy and does not attempt to impose separate restrictions that are broader than section 734.11. We thus recommend that the Q&A be revised as follows:

Question A(4): The research on which I will be reporting in my paper is supported by a grant from the Department of Energy (DOE). The grant requires prepublication clearance by DOE. Does that make any difference under the Export Administration Regulations?

Answer: The transaction is subject to the EAR. If you published in violation of any Department of Energy controls you have accepted in the grant, you may be subject to appropriate administrative, civil, or criminal sanctions under other laws. As provided for in 15 C.F.R. Part 734, if you follow the restrictions in the funding for the research, any export or re-export of information from the research consistent with the national security controls may nonetheless be made under this provision. This includes the ability to transfer or retransfer any information from the research to foreign nationals so long as such transfers are not prohibited by the specific national security controls required by the government sponsor.

Answer to Question D(1)

The OIG also identified question D(1) as one requiring clarification. The answer to this question has made clear the Department's consistent past position that the fundamental research provision is another form of publication, and research conducted under the fundamental research provisions would be treated as public domain research, including the techniques and equipment used for the research.

We agree it would be important to clarify this question to reduce confusion for researchers. If the Department agrees with us to amend the regulations to recognize explicitly that the conduct of fundamental research includes access to the equipment necessary to that research, the Q&A could read as follows:

Question D(1): Do I need a license in order for a foreign graduate student to work in my laboratory?

Answer: Not if the research on which the foreign student is working qualifies as "fundamental research" under §734.8 of this part. In that case, the research is not subject to the EAR, and no license is required for the transfer of technology to conduct fundamental research. This includes the transfer of technology relating to the "use" of equipment necessary for the conduct of fundamental research.

At a minimum, the Department should make clear that access to technology that is freely available for purchase by any person in the United States is not subject to the use restriction in any event. Those who conduct fundamental research recognize that any type of access and dissemination control or restriction on publication would remove the research from the public domain and would subject research to "deemed export" licensing requirements unless covered under § 734.11. The converse, however, should also be retained: that research that is not subject to restrictions on publication, especially including technology freely available, should not otherwise jeopardize the public domain aspects of research.

Generally, there are no export license requirements for transfer of goods within the U.S., and transfer of goods outside the U.S. carries with it the transfer of a great deal of technology that falls under "use" controls. It is reasonable for the Department to conclude that under its current regulatory authority, there is an implied ability, within the U.S., to have access to certain use technology associated with equipment obtained without restriction in the U.S., even by foreign persons. At a minimum, the Commerce Department should therefore clarify Q&A D(1) as follows:

Question D(1): Do I need a license in order for a foreign graduate student to work in my laboratory?

Answer: Not if the research on which the foreign student is working qualifies as "fundamental research" under §734.8 of this part. In that case, the research is not subject to the EAR, and no license is required for the transfer of technology to conduct fundamental research. This includes the transfer of technology necessary for the "use" of equipment that is not subject to a separate restriction on publication. Transfer of "use" technology in the United States necessary for operation, installation (including on-site installation), maintenance (checking), and repair normally accompanies the equipment. Given that the equipment may be provided to foreign nationals in the United States without a license, any "use" technology as noted above would not be restricted within the U.S., provided that the equipment and associated information are readily available in the U.S. commercial market and are not otherwise subject to separate proprietary restrictions.

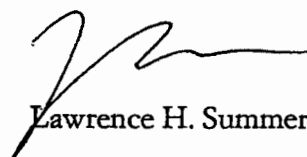
Conclusion

In summary, Harvard recommends that the Commerce Department consider the following points before publishing proposed amendments for further comment:

- a reconsideration of the use technology controls applicable in the context of fundamental research and the elimination of those that do not pose a security threat;
- a rule that allows our international students and scholars access to technology that is necessary for the safe use and effective operation of equipment in the conduct of their fundamental research;
- explicit recognition that information that is available on the open market through, for example, the purchase of equipment is not subject to the use restriction; and
- the concerns associated with probing into individuals' national origin in making licensing determinations.

Harvard is committed to working with the Department to establish policies, rules, and regulations that both protect the nation's security and ensure scientific, technological, and economic advancements.

Sincerely,

A handwritten signature in black ink, appearing to be 'LH Summers', written over the printed name.

Lawrence H. Summers